Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method comprising:

receiving a serial data stream;

sampling each data unit in the data stream N times, and at different locations along each data unit, to obtain multiple data samples per data unit;

detecting edges ~~transitions~~ between adjacent data samples; and

selecting a ~~first~~ current data sample, from among the multiple data samples and representative of the current data unit, based on the location of edges ~~transitions~~ over the current and previous data ~~cycles~~ units and on the location of an expected ideal data sample, to perform data recovery.

2. (Currently Amended) The method of claim 1 wherein the selected ~~first~~ current data sample location is determined by the edge ~~transition~~ in the previous or current data ~~cycles~~ units which is closest to the expected ideal data sample.

3. (Canceled)

4. (Currently Amended) The method of claim 1 wherein the expected ideal data sample is within the current data unit ~~cycle~~ and a distance of N samples from the previously selected data sample.

5. (Currently Amended) The method of claim 1 wherein selecting the current data sample includes,

selecting the ~~first~~ current data sample to lie ~~in the direction~~ substantially at or near ~~of~~ the mid-point between the detected edge ~~transition~~ and the next expected edge ~~transition~~ and at a distance of N-1, N, or N+1 samples from a previously selected data sample~~, whichever is closest to the mid-point~~.

6. (Currently Amended) The method of claim 1 wherein selecting the current ~~first~~ data sample based on the location of edges ~~transitions~~ over the current and previous data units ~~cycles~~ includes selecting a data sample based on 2*N consecutive data samples across the current data unit cycle and the previous data unit ~~cycle~~.

7. (Currently Amended) The method of claim 1 wherein if no edges ~~transitions~~ are detected the selected ~~first~~ current data sample location is the expected ideal data sample location.

8. (Currently Amended) The method of claim 1 wherein if only one edge ~~transition~~ is detected, that edge ~~transition~~ determines the selected ~~first~~ current data sample location.

9. (Currently Amended) The method of claim 1 wherein if multiple edges transitions are detected and all correspond to indicate the same data sample location, then that data sample location is selected as the first current data sample location.

10. (Currently Amended) The method of claim 1 wherein if multiple data edges transitions are detected and they correspond to indicate different data samples locations, then the selected first current data sample location is the expected ideal data sample location.

11. (Currently Amended) The method of claim 1 further comprising:

maintaining a list of the M previous selected data samples locations, where M is an integer value.

12. (Currently Amended) The method of claim 1 wherein in selecting the first current data sample, as between given two equally likely data sample locations, the data sample location most recently selected in previous cycles data units is chosen.

13. (Currently Amended) An apparatus comprising:

a sampling device to sample data units of a serial data stream N times at different points in each data unit, where N is an integer value;

an edge detector coupled to the sampling device to detect edges ~~transitions~~ between consecutive data unit samples;

and a selection controller coupled to the edge detector to receive detected edges ~~transitions~~ from the edge detector and select a first data sample to represent the current data unit according a predefined decision algorithm for data sample timing correction employing the current and previous data ~~unit cycles~~ units and ~~an~~ the expected ideal current data sample location.

14. (Currently Amended) The apparatus of claim 13 wherein the expected ideal current data sample is located within the current data unit ~~cycle~~ and a distance of N samples from a previously selected ~~second~~ data sample in the previous data unit ~~cycle~~.

15. (Original) The apparatus of claim 13 wherein the value of N is six.

16. (Currently Amended) The apparatus of claim 13 wherein the selection controller selects the ~~first~~ current data sample based on an ~~first~~ edge in ~~transition for either~~ the previous or current data units ~~cycles~~, whichever edge ~~transition~~ is closest to the expected ideal current data sample location.

17. (Currently Amended) The apparatus of claim 13 wherein the selection controller selects the ~~first~~ current data sample to lie ~~in the direction of~~ substantially at or near the mid-point between a detected ~~first~~ edge ~~transition~~ and

a next expected edge ~~transition~~ and also at a distance of -1, 0, or +1 samples from the expected ideal data sample location~~, whichever is closest to the mid-point~~.

18. (Currently Amended) The apparatus of claim 13 wherein if no edges ~~transitions~~ are detected by the edge detector, the selection controller selects the expected ideal data sample location to obtain the ~~first~~ current data sample.

19. (Currently Amended) The apparatus of claim 13 wherein if only one edge transition is detected by the edge detector then the selection controller selects the ~~first~~ current data sample position which ~~to~~ lies ~~in the direction of~~ substantially at or near the mid-point between a detected first edge ~~transition~~ and a next expected edge ~~transition~~ and also at a distance of -1, 0, or +1 samples from the expected ideal data sample location~~, whichever is closest to the mid-point~~.

20. (Currently Amended) The apparatus of claim 13 wherein if multiple edges ~~transitions~~ are detected by the edge detector and all ~~transitions correspond to~~ edges indicate the same ~~first~~ data sample location, then the selection controller selects that ~~first~~ data sample location as the next expected ideal data sample location.

21. (Currently Amended) The apparatus of claim 13 wherein if multiple data edges ~~transitions~~ are detected by the edge detector and they ~~correspond to~~ indicate different data sample~~s~~ locations, then the selection controller selects ~~the first data sample to correspond with to~~ the expected ideal data sample location.

22. (Currently Amended) The apparatus of claim 13 further comprising:

a storage device to maintaining a list of the M previous selected data sample~~s~~ locations, where M is an integer value.

23. (Currently Amended) The apparatus of claim 13 wherein, ~~as between~~ given two equally likely data sample locations, the selection controller selects the ~~first~~ data sample location that was most recently selected in previous cycles.

24. (Currently Amended) A machine-readable medium having one or more instructions to perform data recovery, which when executed by a processor, causes the processor to perform operations comprising:

sampling each data unit in a data stream N times, where N is an integer value, at different locations along each data unit, to obtain multiple data samples per data unit;

detecting edges ~~transitions~~ between adjacent data samples; and

selecting a ~~first~~ current data sample representative of the current data unit based on the location of edges ~~transitions~~ over the previous and current data

units and the location of an expected ideal current data sample to perform data recovery.

25. (Currently Amended) The machine-readable medium of claim 24 wherein the representative first data sample is selected to lie ~~in the direction of~~ substantially at or nearer to the mid-point between a first detected edge and a next expected edge and ~~yet~~ also is adjacent to, or equal to, the expected ideal current data sample location within the current data unit cycle.

26. (Currently Amended) The machine-readable medium of claim 24 wherein if no edges ~~transitions~~ are detected the selected ~~first~~ current data sample ~~corresponds to~~ has the same location as the expected ideal current data sample.

27. (Currently Amended) The machine-readable medium of claim 24 wherein if only one edge ~~transition~~ is detected, then that edge ~~transition~~ determines the selected ~~first~~ current data sample to be a sample which lies ~~in the direction of~~ substantially at or near the mid-point between the detected edge ~~transition~~ and a next expected edge ~~transition~~ and at a distance of -1, 0, or +1 samples from the expected ideal current data sample location~~, whichever is closest to the mid-point~~.

28. (Currently Amended) The machine-readable medium of claim 24 wherein if multiple edges ~~transitions~~ are detected and all ~~correspond to~~ indicate the same data sample location, then that data sample location is selected as the ~~first~~ current data sample.

29. (Currently Amended) The machine-readable medium of claim 24 wherein if multiple data edges ~~transitions~~ are detected and they ~~correspond to~~ indicate different ~~edge transitions~~ data sample locations, then the selected ~~first~~ current data sample is at the same location as the expected ideal current data sample.

30. (Currently Amended) The machine-readable medium of claim 24 wherein selecting the ~~first~~ current data sample, ~~as between~~ given two equally likely data sample locations, the data sample location most recently selected in previous cycles is chosen as the ~~first~~ current data sample location.

31. (Currently Amended) An apparatus comprising:

a sampling means for sampling data units of a serial data stream N times at different points in each data unit, where N is an integer value;

an edge detecting means coupled to the sampling means, the edge detecting means for detecting edges ~~transitions~~ between consecutive data ~~unit~~ samples; and

a selection means coupled to the edge detector, the selection means for receiving detected edges ~~transitions~~ from the edge ~~detector~~ detecting means and select a ~~first~~ current data sample to represent a current data unit.

32. (Currently Amended) The apparatus of claim 31 wherein the ~~first~~ current data sample is located within a current data unit ~~cycle~~ and at a distance of N-1 to N+1 samples from a previously selected ~~second~~ data sample in a previous data unit ~~cycle~~.

33. (Currently Amended) The apparatus of claim 31 wherein the selection means selects the ~~first~~ current data sample based on ~~a first~~ an edge ~~transition~~ for either the previous or current data ~~cycles~~, whichever edge ~~transition~~ is closest to an expected ideal current data sample.

COMMENTS

The enclosed is responsive to the Examiner's Final Office Action mailed on January 13, 2005. At the time the Examiner mailed the Office Action claims 1-33 were pending. By way of the present response the Applicants have: 1) amended claims 1-2, 4-14 and 16-33; 2) added no new claims; and 3) canceled claim 3. As such, claims 1-2, 4-33 are now pending. The Applicants respectfully request reconsideration of the present application and the allowance of all claims now presented.

Specification Objections

The applicant appreciates the Examiner's diligence in offering possible improvements to the application as filed. Nevertheless, the Applicant has not attempted to enter these amendments. The requirements for the specification as filed are defined in 35 U.S.C. §112, paragraph 1 which are understood to include enablement, best mode and written description. It is clear from the Examiner's own offered amendments that the Examiner has fully comprehended the Applicant's invention from the specification as filed. Therefore, the Examiner's own offered amendments to the specification serve as proof that the specification as filed does not offend any of the enablement, best mode and written description requirements. Therefore, no amendment to the specification as filed are required.

Claim Rejections

35 U.S.C. 112, second paragraph, Rejections

Applicant herewith submits amendments to the claims as offered by the Examiner in the Office Action mailed January 13, 2005.

35 U.S.C. 102(b) Rejections

In regards to claim 1, the Examiner states that:

> Received digital data is oversampled (col. 2, line 64-67) in Van Der Tuijn's preferred embodiment. In one embodiment disclosed by Van Der Tuijn (col. 4, lines 55-56), "N" = 6-times oversampling is used for "sampling each data unit in the data stream N times to obtain multiple data samples per data unit".
> (Office Action dated 1/13/05, page 20.)

Amended claim 1 states:

> 1. A method comprising:
> receiving a serial data stream;
> sampling each data unit in the data stream N times, and at different locations along each data unit, to obtain multiple data samples per data unit;
> detecting edges between adjacent data samples; and
> selecting a current data sample, from among the multiple data samples and representative of the current data unit, based on the location of edges over the current and previous data units and on the location of an expected ideal data sample, to perform data recovery.
> (Emphasis Added)

Applicant respectfully submits that Van Der Tuijn fails to disclose "sampling each data unit in the data stream N times, and at different locations along each data unit, to obtain multiple data samples per data unit." Van Der Tuijn is completely silent about oversampling each data unit at different locations along each data unit. In contrast, Van Dr Tuijn merely mentions oversampling

in general, with no disclosure or suggestion that such oversampling occurs at different locations along each sampled data unit. As such, Van Der Tuijn fails to disclose each and every element of claim 1. Therefore, Van Der Tuijn does not anticipate claim 1 under 35 U.S.C. §102(b).

Independent claims 13 and 31 contain substantially the same limitation as discussed above in regards to claim 1. As such, Van Der Tuijn also fails to disclose each and every limitation of independent claims 13 and 31. Hence, Van Der Tuijn does not anticipate independent claims 13 and 13 under 35 U.S.C. §102(b).

Dependent claims 2, 4-12, 14-23 and 32-33 all depend on and include the limitations of independent claims 1, 13 and 31 respectfully. Hence, Van Der Tuijn also fails to anticipate claims 2, 4-12, 14-23 and 32-33 under 35 U.S.C. §102(b).

35 U.S.C. 103(a) Rejections

In regards to independent claim 24, the Examiner states that:

> Van Der Tuijn does not disclose using software instructions to implement the logic operations described in his sample selection arrangements... It would've been obvious to one skilled in the art at the time the invention was made to implement Van Der Tuijn's logic operations using a programmed computer.

(Office Action dated 1/13/05, page 23)

Applicants respectfully submit that regardless of whether combining a programmed computer is obvious, Van Der Tuijn still fails to disclose "sampling each data unit in a data stream N times, where N is an integer value, at different locations along each data unit, to obtain multiple data samples per data unit." As

mentioned above in regards to claim 1, Van Der Tuijn is completely silent about oversampling each data unit at different locations along each data unit. In contrast, Van Dr Tuijn merely mentions oversampling in general, with no disclosure or suggestion that such oversampling occurs at different locations along each sampled data unit. As such, the combination of Van Der Tuijn and a programmed computer fail to disclose each and every element of independent claim 24. Therefore, Van Der Tuijn and a programmed computer do not make claim 24 obvious under 35 U.S.C. §103(a).

Dependent claims 25-30 all depend on and include the limitations of independent claim 24. Hence, Van Der Tuijn and a programmed computer also fail to make claims 25-30 obvious under 35 U.S.C. §103(a).

In light of the comments above, the Applicant respectfully requests the allowance of all claims.

CONCLUSION

For the reasons provided above, applicant respectfully submits that the current set of claims are allowable. If the Examiner believes an additional telephone conference would expedite or assist in the allowance of the present application, the Examiner is invited to call Michael J. Mallie at (408) 720-8300.

Authorization is hereby given to charge our Deposit Account No. 02-2666 for any charges that may be due.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN

Date: 6/13/05

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